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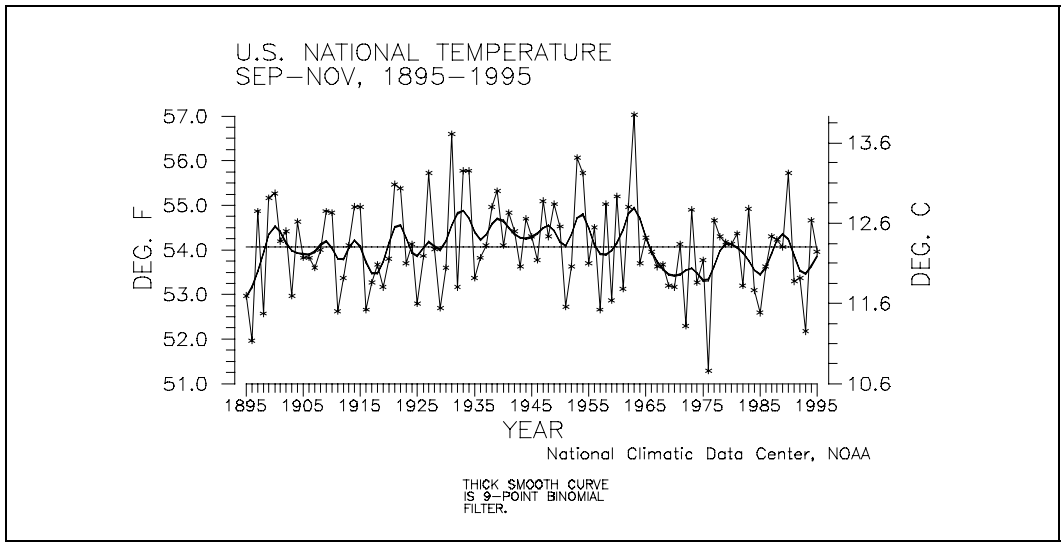
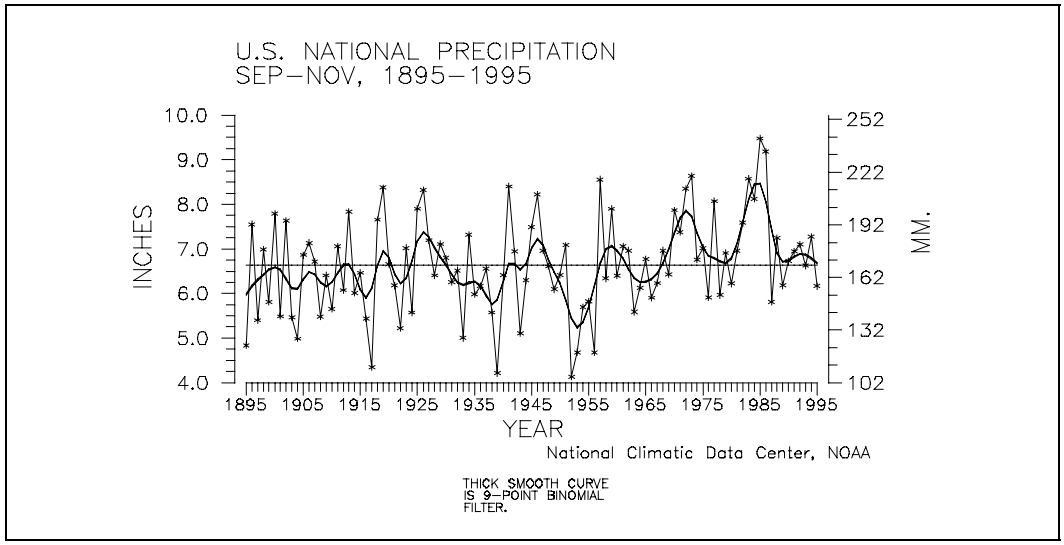
CLIMATE VARIATIONS BULLETIN





noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE / NATIONAL CLIMATIC DATA CENTER ASHEVILLE, N.C.

This CLIMATE VARIATIONS BULLETIN (CVB) is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Analysis Center, and preliminary tornado statistics obtained from the NWS National Severe Storms Forecast Center. THE CURRENT DATA SHOULD BE USED WITH CAUTION. These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), the hurricane datasets (TD-9636 and TD-9697), the tornado dataset (STORM DATA), and the monthly station dataset (LCD supplemental files). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

The narrative, tables, and graphs in the CVB are also available via automated facsimile. The previous month's summary can be obtained after the tenth of the month by dialing 704-271-4570 and selecting the appropriate menu codes. A touch-tone fax machine is required.

If you have access to the Internet, copies of the CVB are available via both the NCDC's World Wide Web (WWW) server and the NCDC's anonymous FTP server.

NCDC's WWW server
URL for the CVB: http://www.ncdc.noaa.gov/publications/cvb/cvb.html

NCDC's anonymous FTP server
Machine: ftp.ncdc.noaa.gov
Directory: /pub/data/cvb

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 704-271-4994 or fax a letter to 704-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 704-271-4800 or sending a fax to 704-271-4876 or by writing to:

National Climatic Data Center, NOAA
Federal Building
151 Patton Avenue, Room 120
Asheville, NC 28801-5001

If you use any of the information from this CVB, please identify "National Climatic Data Center, NOAA" as the source.

UNITED STATES NOVEMBER CLIMATE IN HISTORICAL PERSPECTIVE

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Preliminary data for November 1995 indicate that temperature averaged across the contiguous United States was at the long-term mean (see Figure 1). November 1995, with an averaged temperature of 42.3° (F), ranked as the 50th coolest November since national records began in 1895. The 1995 value is based on preliminary data, which has been shown to be within 0.26°F (0.14°C) of the final data over a 46-month period. This confidence interval is indicated in the figure by '+'. The darker smooth curve is a nine-point binomial filter that averages out the year-to-year fluctuations and shows the longer-term variations. More than a quarter of the country (28.2%) averaged much cooler than normal while an additional one fourth (25.4%) of the country averaged much warmer than normal for November 1995.

With an areally-averaged national precipitation value of 1.86 inches, November 1995 was the 30th driest November on record. The preliminary value for precipitation is estimated to be accurate to within 0.14 inches (3.56 millimeters) and the confidence interval is plotted in Figure 2 as a '+'. Over a fifth (22.2%) of the country experienced much drier than normal conditions while 3.4% was much wetter than normal.

Historical precipitation is shown in a different way in Figure 3. The November precipitation for each climate division in the contiguous U.S. was first standardized using the gamma distribution over the 1931-90 period. These gamma-standardized values were then weighted by area and averaged to determine a national standardized precipitation value. These national weighted values were then normalized over their period of record. Negative values are drier and positive values are wetter than the mean. This index gives a more accurate indication of how precipitation across the country compares to the local normal (60-year average) climate. The national standardized precipitation ranked November 1995 as the 20th driest such month on record.

In order to show more of a historical perspective, the precipitation and temperature rankings for the periods November 1995, October-November 1995, June-November 1995, and December 1994-November 1995 for the nine climatically homogeneous regions, as well as the national rankings, are listed in Table 1.

The regional rankings for temperature for the month of November indicate that temperatures were much cooler than normal for the eastern third of the country and much warmer than normal for the western third of the country. This reflected the predominant upper-level flow for the month consisting of a significant ridge over the west and a trough from the Mississippi valley, eastward. It was the third coolest November since 1895 for the Southeast region (Figure 11), fifth coolest for the East-North Central region, seventh coolest for the Central region, and the ninth coolest November in the 101-year period of record for the Northeast region. Under the dominance of an upper-level ridge, both the West and Southwest regions each had the second warmest November since records began. It was the sixth warmest November on record for the Northwest region. It can be noted that while November 1995 was the second warmest such month on record for the West region, it was just last year that this region had their coolest November since 1895 (Figure 12).

November 1995 was the sixth driest such month on record for the West region (Figure 13). Six of the last seven such months have had precipitation averages below to much below the long-term mean. November 1995 was also the 12th driest such month for the Southwest region. It was the 22nd wettest November on record for the Northwest region (Figure 14) and the 29th wettest November on record for the Northeast region. Remnants of the drought from earlier this year still exist in some areas but above normal precipitation totals over the past two months have done much to alleviate the problem.

National averaged temperature for the eleven month period January-November for 1895-1995 is shown in Figure 4. The January-November 1995 temperature was above the long-term mean ranking as

the 22nd warmest such period since 1895. For the year-to-date, none of the country averaged much cooler than normal while 8.3% of the country averaged much warmer than normal.

Figure 5 shows the historical January-November national averaged precipitation. The year-to-date for 1995 was the 14th wettest such eleven-month period since records began. The last seven January-November periods have averaged above to much above normal. For the year-to-date, 1.6% of the country averaged much drier than normal while about a tenth (10.4%) of the country averaged much wetter than normal. When the local normal climate is taken into account, January-November 1995 ranked as the 23rd wettest such period since 1895 (Figure 6).

Figure 7A shows, in illustrative map form, the November 1995 temperature rankings for the 48 contiguous states. Results of the predominant upper-level flow pattern during November of ridge/west and trough/east are obvious at first glance. Twenty states, all along or east of the Mississippi River, ranked within the top ten coolest on record while eleven others were within the cool third of the historical distribution. Nine states, all in the Rockies and westward, ranked within the top ten warmest for the 101-year period of record. November 1995 was the second coolest on record for Michigan and the third coolest on record for AL, GA, IN, SC, and WI. November 1995 was the warmest on record for Arizona, second warmest for Nevada and Utah, and third warmest for California and Oregon.

November 1995 state ranks for precipitation are shown in Figure 7B. It was the second driest November on record for Nevada, sixth driest for California, seventh driest for Colorado and Oklahoma, and the tenth driest for New Mexico. Seven other states were within the dry third of the distribution. November 1995 was the ninth wettest such month for Michigan, the only state within the top ten wet category. Seventeen other states were within the wet third of the historical distribution. It must be stressed that, when the final values for precipitation are calculated, these ranks *WILL* change due to the use of a denser station network. ***It should also be noted that the November state precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.***

State temperature and precipitation ranks for the eleven-month period, January-November 1995, are shown in map form in Figures 8A and 8B. Only one state, Arizona, ranked within the top ten warm category for the year-to-date while eight others ranked within the warm third of the historical distribution. For the January through November period, no states ranked in either the top ten cool or the top one-third cool of the distribution (Figure 8A). It was the third wettest year-to-date for Idaho and the fifth wettest year-to-date for California and South Dakota. Seventeen other states ranked in the wet third of the distribution. It was the eighth driest year-to-date period since 1895 for Arkansas. Only eight other states were within the dry third of the historical distribution (Figure 8B).

During November long-term drought coverage in the United States remained practically unchanged and has remained nearly constant for the last five months. Nationally, long-term drought conditions (as defined by the Palmer Drought Index) for November 1995 hovered at about three percent of the country while the percent coverage of severe to extreme wet area fell to about an eighth of the country (Figure 9). Table 2 lists the precipitation ranks and statistics for selected river basins for the 1995-1996 Hydrologic Year. The core wet areas included the northern Great Plains, northern High Plains, the northern Rockies, portions of the interior Northwest, and portions of the Southeast. The Palmer dry areas included portions of the Northeast region, the middle and lower Mississippi valley, northwestern Arizona and parts of the southern High Plains.

Table 3 shows extremes, 1961-90 normals, and the November 1995 values for both precipitation and temperature for the nine regions and the contiguous U.S.

Precipitation across the Primary Hard Red Winter Wheat Belt for the initial two-month period of the growing season averaged much below normal (Figure 10). This is the driest start (October-November) to their growing season since 1921.

According to preliminary data from the National Weather Service's National Severe Storms Forecast Center, there were 80 tornadoes across the contiguous United States in November 1995. The 1953-1994 average tornado count for November is 29. Extremes for November include a minimum of no tornadoes in 1976 and a maximum of 149 in 1992. For the year-to-date, 1170 tornadoes have occurred in 1995 compared to a 1953-94 average of 780. The year-to-date extremes are 1282 in 1992 and 400 in 1953. It should be noted that the preliminary tornado count is generally higher than the final count and that observations have generally improved with time.

UNITED STATES AUTUMN CLIMATE IN HISTORICAL PERSPECTIVE

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Preliminary data for autumn (September-November) 1995 indicate that temperature averaged across the contiguous United States was near the long-term mean, ranking as the 47th coolest autumn on record (Table 4). Autumn 1995 was cooler nationwide than Autumn 1994 but warmer than the previous three autumns (Figure 15). One seventh (14.3%) of the country averaged much warmer than normal while about the same percentage (13.6%) averaged much cooler than normal for autumn 1995.

Areally-averaged September through November precipitation for the nation was below the long-term mean, ranking 1995 as the 32nd driest autumn in the 101-year record (Table 4). By this measure, Autumn 1995 continued the pattern of non-extreme national overall precipitation that has occurred since the mid-1980's (Figure 16). The national standardized precipitation index (Figure 17) ranked 1995 as the eleventh driest autumn on record. (The preceding monthly report explains how this index is computed.) A fourth (26.3%) of the contiguous U.S. averaged much drier than normal for September-November 1995, while 3.4% experienced much wetter than normal conditions.

The temperature and precipitation ranks for Autumn 1995 for the nine climatically homogeneous regions in the United States are listed in Table 4. The average autumn temperature pattern was characterized by a simple ridge-trough pattern, with unusual warmth in the west and cold in the east. The preliminary data indicate that the West region had the warmest autumn on record in 1995, which was a considerable change from the previous year and marked a return to the warmth of the late 1980's to early 1990's (Figure 18). The Southwest region ranked seventh warmest and Northwest twelfth warmest (Table 4). The Central and East North Central regions both ranked ninth coldest on record for Autumn 1995. For the East North Central region, Autumn 1995 was a considerable change from the previous year and marked a return to the unusual cold conditions of the early 1990's (Figure 19). The Southeast region had the 14th coolest autumn on record, with the remaining regions falling in or near the middle third of the historical distribution.

The general precipitation pattern for Autumn 1995 showed unusually wet conditions along the east coast, regional dryness stretching from California into the Central region, and moderate conditions in the regions covering the Pacific Northwest to the Great Lakes (Table 4). The preliminary data indicate that the West region (California-Nevada) had the second driest autumn on record. This continued a pattern of near to much below normal autumn precipitation for the region which has lasted, thus far, ten years (Figure 20). At the other extreme, the Northeast region had the 13th wettest autumn in 1995, continuing a pattern of near to above normal precipitation which has dominated much of the last two decades (Figure 21).

On a statewide basis, eight states (GA, IL, IN, IA, KY, MI, TN, WI) ranked in the top ten coldest category for autumn 1995, while four states (AZ, CA, NV, OR) fell in the top ten warmest category (Figure 23A). For precipitation, six states (AR, CA, KS, MO, NV, UT) ranked in the top ten driest category, and two states (CT and NH) ranked in the top ten wettest category (Figure 23B).

According to preliminary data from the National Weather Service's National Severe Storms Forecast Center, there were 151 tornadoes across the contiguous United States during Autumn 1995 (Figure 22). The 1953-1994 average tornado count for autumn is 94. The extremes: 23 autumn tornadoes in 1953 and 264 in 1992. It should be noted that the preliminary tornado count is generally higher than the final count and that the tornado observations have generally improved with time as better observing practices and instrumentation (especially weather radar and satellites) were utilized.

TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED ON THE PERIOD 1895-1995. 1 = DRIEST/COLDEST, 101 = WETTEST/WARMEST FOR NOVEMBER 1995, 101 = WETTEST/WARMEST FOR OCT-NOV 1995, 101 = WETTEST/WARMEST FOR JUN-NOV 1995, 100 = WETTEST/WARMEST FOR DEC 1994-NOV 1995.

REGION	NOV 1995	OCT-NOV 1995	JUN-NOV 1995	DEC 1994-NOV 1995
PRECIPITATION:				
NORTHEAST	73	97	44	15
EAST NORTH CENTRAL	54	74	56	62
CENTRAL	38	43	31	48
SOUTHEAST	67	89	88	71
WEST NORTH CENTRAL	44	68	74	90
SOUTH	32	14	28	60
SOUTHWEST	12	2	13	65
NORTHWEST	80	74	89	85
WEST	6	3	3	95
NATIONAL	30	41	41	82
TEMPERATURE:				
NORTHEAST	9	46	71	80
EAST NORTH CENTRAL	5	11	45	67
CENTRAL	7	24	37	66
SOUTHEAST	3	22	35	66
WEST NORTH CENTRAL	56	35	45	69
SOUTH	52	43	33	69
SOUTHWEST	100	90	86	94
NORTHWEST	96	77	73	88
WEST	100	98	85	86
NATIONAL	50	49	61	88

TABLE 2.
STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCT-NOV 1995, WHERE RANK OF 1 = DRIEST, 101 = WETTEST, BASED ON THE PERIOD 1895 TO 1995; AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF NOVEMBER 1995.
RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN	PRECIPITATION RANK	% AREA DRY	% AREA WET
MISSOURI BASIN	24	.0%	36.3%
PACIFIC NORTHWEST BASIN	77	.0%	42.6%
CALIFORNIA RIVER BASIN	3	.0%	.0%
GREAT BASIN	2	.0%	21.5%
UPPER COLORADO BASIN	2	.0%	.0%
LOWER COLORADO BASIN	13	10.4%	.0%
RIO GRANDE BASIN	22	18.3%	3.9%
ARKANSAS-WHITE-RED BASIN	1	5.1%	5.8%
TEXAS GULF COAST BASIN	15	.0%	.0%
SOURIS-RED-RAINY BASIN	84	.0%	41.0%
UPPER MISSISSIPPI BASIN	48	.0%	16.2%
LOWER MISSISSIPPI BASIN	38	.0%	.0%
GREAT LAKES BASIN	93	4.1%	.0%
OHIO RIVER BASIN	51	4.8%	.0%
TENNESSEE RIVER BASIN	93	.0%	39.6%
NEW ENGLAND BASIN	97	.0%	4.5%
MID-ATLANTIC BASIN	94	4.8%	.0%
SOUTH ATLANTIC-GULF BASIN	89	.0%	22.7%

TABLE 3. EXTREMES, 1961-90 NORMALS, AND 1995 VALUES FOR NOVEMBER

PRECIPITATION (INCHES)

REGION	DRIEST VALUE	DRIEST YEAR	WETTEST VALUE	WETTEST YEAR	NORMAL PCPN	1995 PCPN
NORTHEAST	.88	1917	6.34	1983	3.84	3.99
EAST NORTH CENTRAL	.20	1904	4.03	1931	1.89	1.80
CENTRAL	.71	1904	7.71	1985	3.53	2.62
SOUTHEAST	.83	1931	8.39	1948	3.30	3.16
WEST NORTH CENTRAL	.06	1939	1.63	1896	.74	.65
SOUTH	.20	1949	5.21	1940	2.63	1.70
SOUTHWEST	.06	1904	2.37	1905	.90	.33
NORTHWEST	.30	1936	7.61	1909	3.78	4.92
WEST	.01	1929	5.56	1926	2.22	.24
NATIONAL	.88	1917	3.76	1983	2.32	1.86

TEMPERATURE (DEGREES F)

REGION	COLDEST VALUE	COLDEST YEAR	WARMEST VALUE	WARMEST YEAR	NORMAL TEMP	1995 TEMP
NORTHEAST	32.3	1901	44.7	1931	38.7	34.4
EAST NORTH CENTRAL	24.9	1959	39.8	1899	33.1	26.0
CENTRAL	35.9	1976	51.4	1931	44.2	39.1
SOUTHEAST	48.2	1976	62.4	1985	55.0	50.6
WEST NORTH CENTRAL	17.3	1985	40.3	1949	30.9	31.5
SOUTH	45.5	1976	58.7	1909	52.5	52.1
SOUTHWEST	36.1	1972	46.9	1949	41.4	45.7
NORTHWEST	27.2	1985	42.8	1899	37.0	41.6
WEST	40.0	1994	51.8	1949	46.0	51.0
NATIONAL	38.2	1911	46.1	1909	42.7	42.3

TABLE 4. TEMPERATURE AND PRECIPITATION RANKINGS FOR SEP-NOV 1995, BASED ON THE PERIOD 1895-1995. 1 = DRIEST/COLDEST, 101 = WETTEST/HOTTEST.

REGION	PRECIPITATION	TEMPERATURE
NORTHEAST	89	30
EAST NORTH CENTRAL	57	9
CENTRAL	26	9
SOUTHEAST	80	14
WEST NORTH CENTRAL	64	38
SOUTH	24	38
SOUTHWEST	19	95
NORTHWEST	65	90
WEST	2	101
NATIONAL	32	47

TABLE 5. EXTREMES, 1961-90 NORMALS, AND 1995 VALUES FOR AUTUMN (SEP-NOV)

	PRECIPITATION (INCHES)					
	DRIEST		WETTEST		NORMAL	1995
REGION	VALUE	YEAR	VALUE	YEAR	PCPN	PCPN
NORTHEAST	5.01	1908	15.54	1977	10.82	12.62
EAST NORTH CENTRAL	2.92	1976	11.82	1941	7.96	7.47
CENTRAL	3.99	1953	14.92	1926	10.20	7.68
SOUTHEAST	4.27	1931	17.71	1929	10.79	12.58
WEST NORTH CENTRAL	1.21	1952	6.41	1946	3.44	3.66
SOUTH	3.79	1917	13.88	1986	9.19	6.38
SOUTHWEST	.95	1956	6.51	1972	3.48	2.11
NORTHWEST	1.51	1936	11.35	1973	7.16	8.10
WEST	.38	1929	7.46	1982	3.85	.45
NATIONAL	4.14	1952	9.48	1985	7.11	6.17

	TEMPERATURE (DEGREES F)					
	COLDEST		WARMEST		NORMAL	1995
REGION	VALUE	YEAR	VALUE	YEAR	TEMP	TEMP
NORTHEAST	45.2	1917	53.8	1931	49.1	48.5
EAST NORTH CENTRAL	41.6	1896	52.5	1931	46.6	43.7
CENTRAL	49.9	1976	61.2	1931	55.4	53.4
SOUTHEAST	59.5	1976	67.9	1919	63.9	62.9
WEST NORTH CENTRAL	38.0	1985	50.3	1963	44.5	44.2
SOUTH	58.2	1976	68.2	1931	63.2	63.0
SOUTHWEST	49.9	1912	56.1	1963	52.9	54.9
NORTHWEST	41.9	1985	50.3	1963	47.3	49.3
WEST	53.2	1916	59.2	1995	56.3	59.2
NATIONAL	51.3	1976	57.0	1963	54.0	54.0

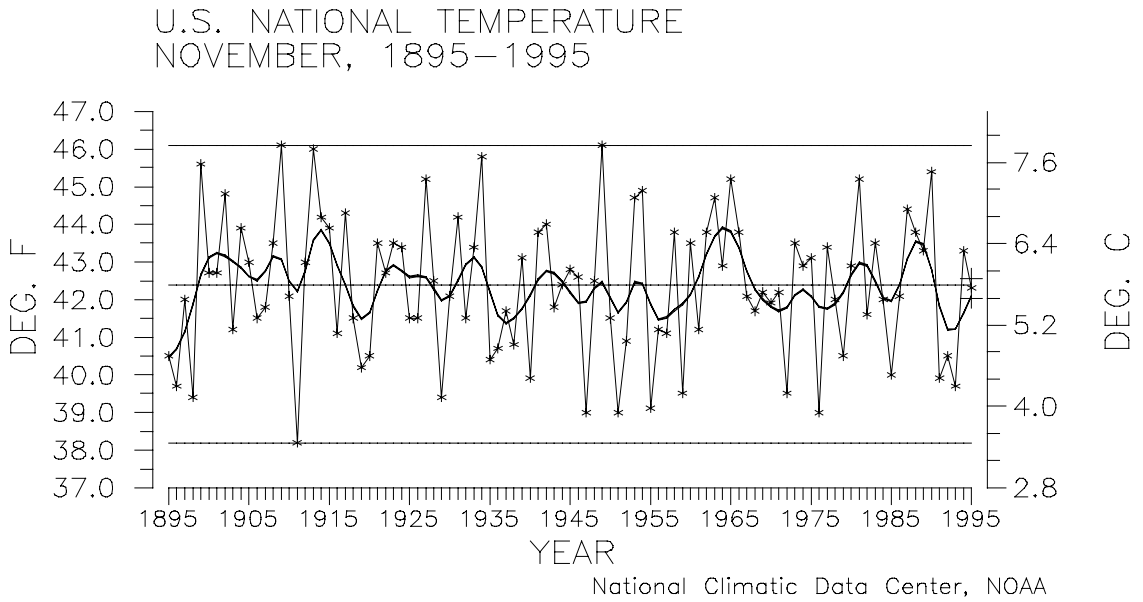

Figure 1

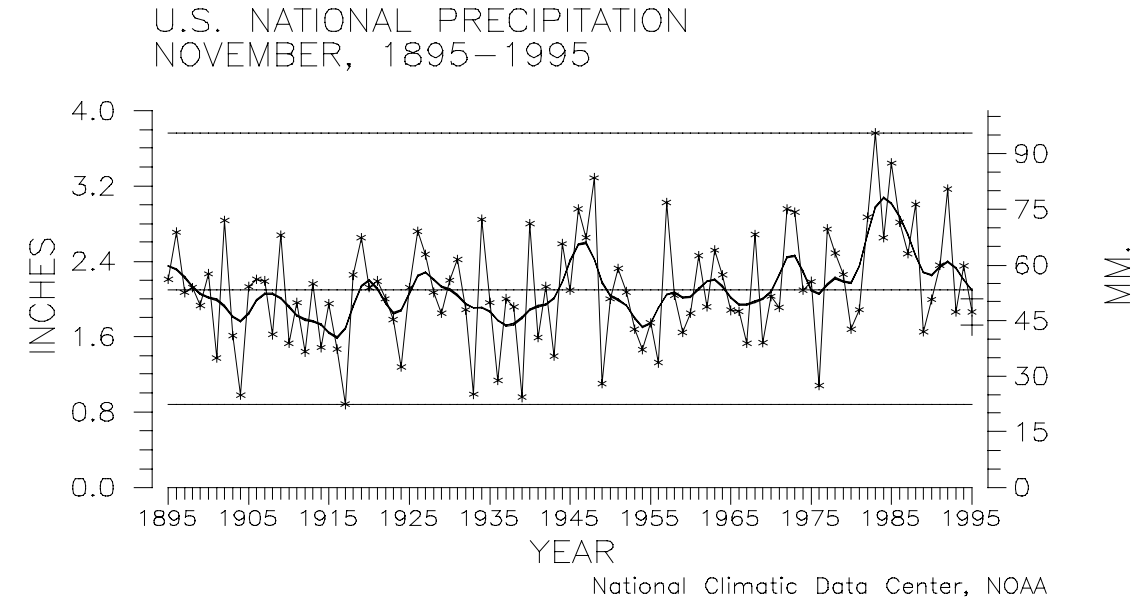

Figure 2

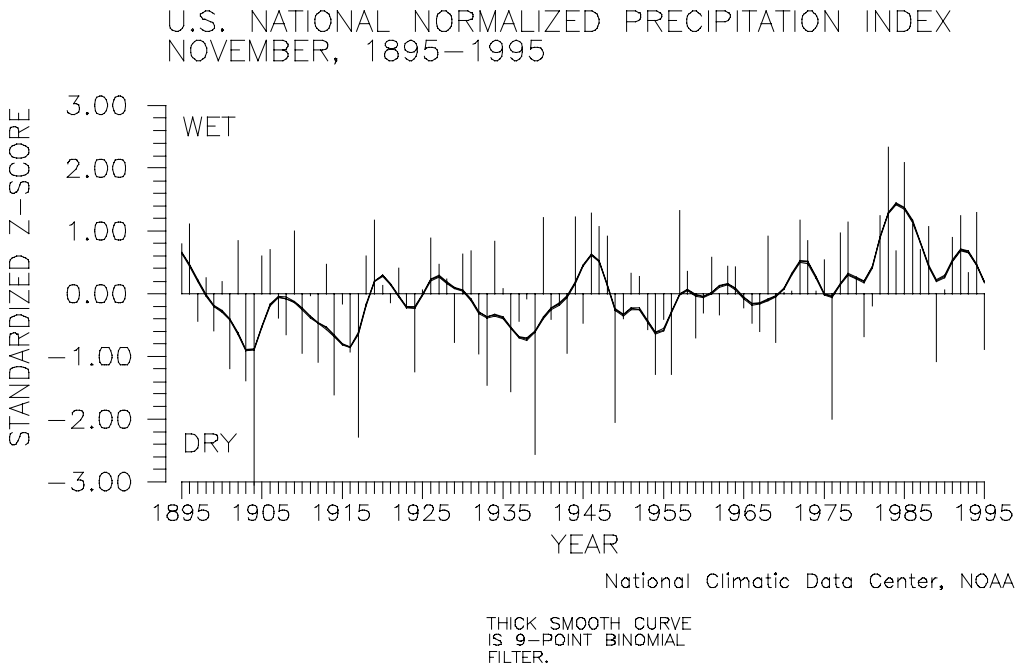

Figure 3

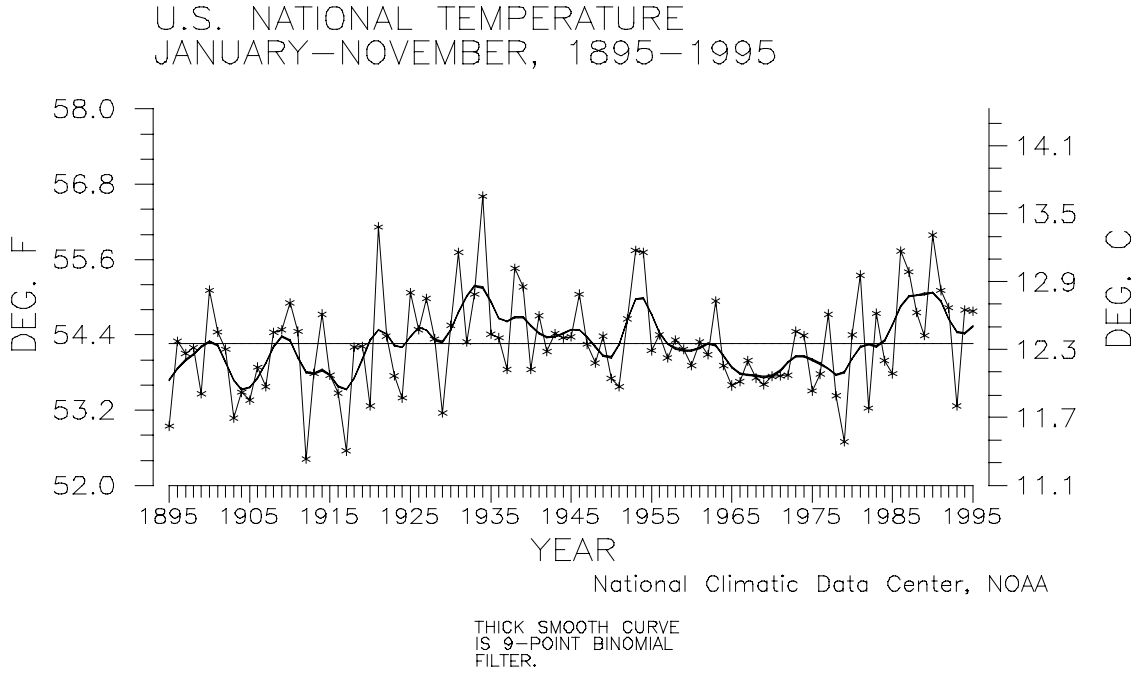

Figure 4

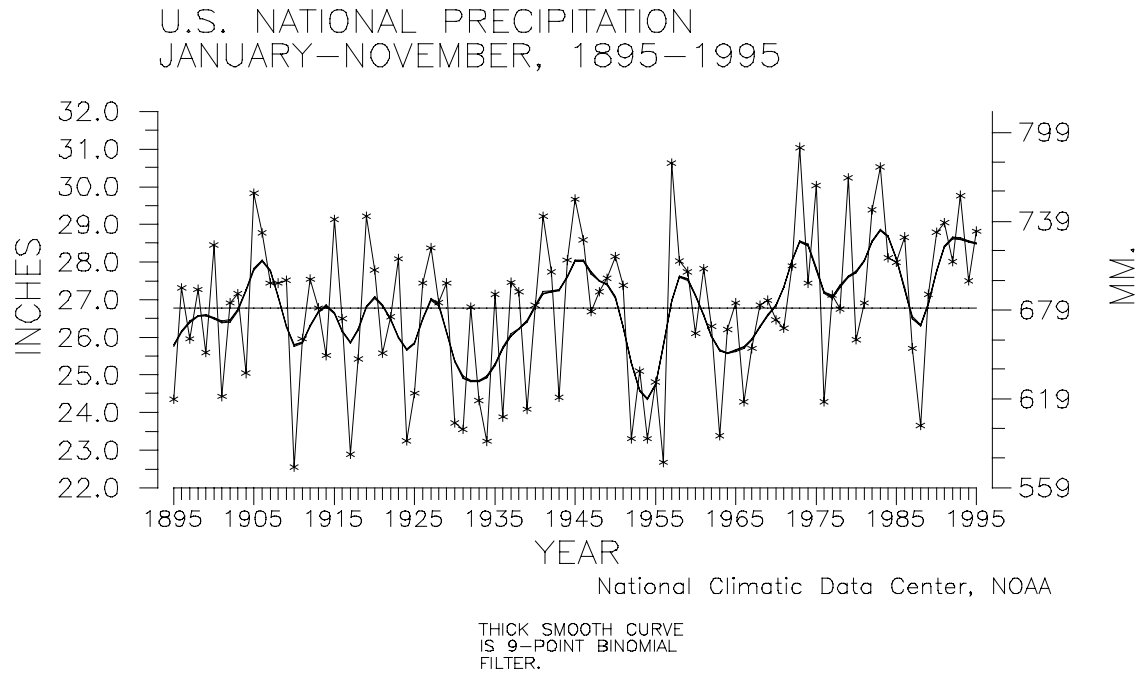

Figure 5

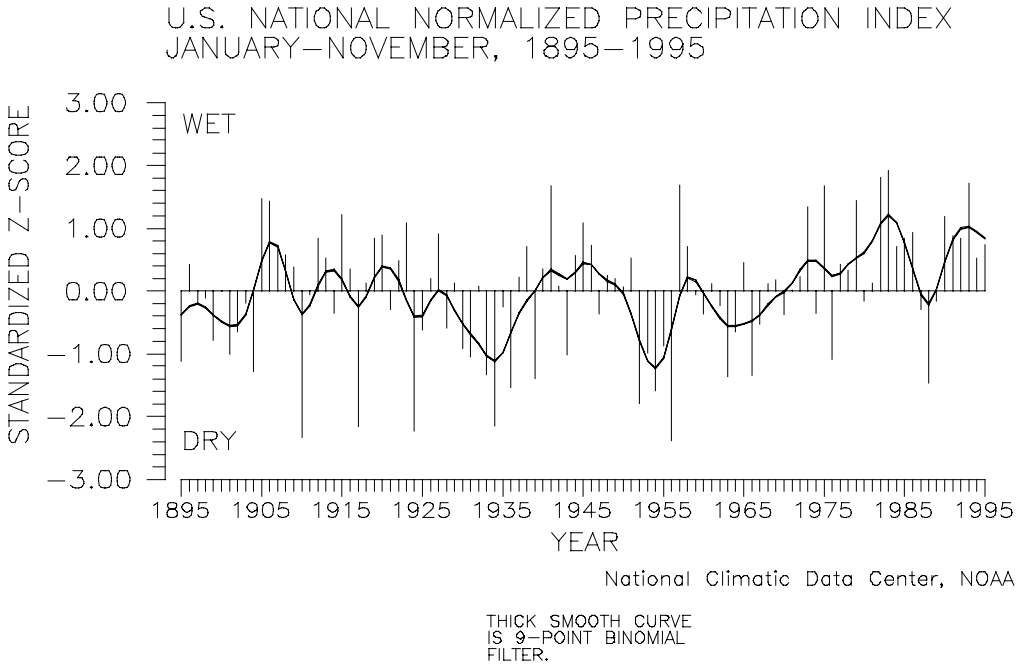

Figure 6

NOVEMBER 1995 STATEWIDE RANKS

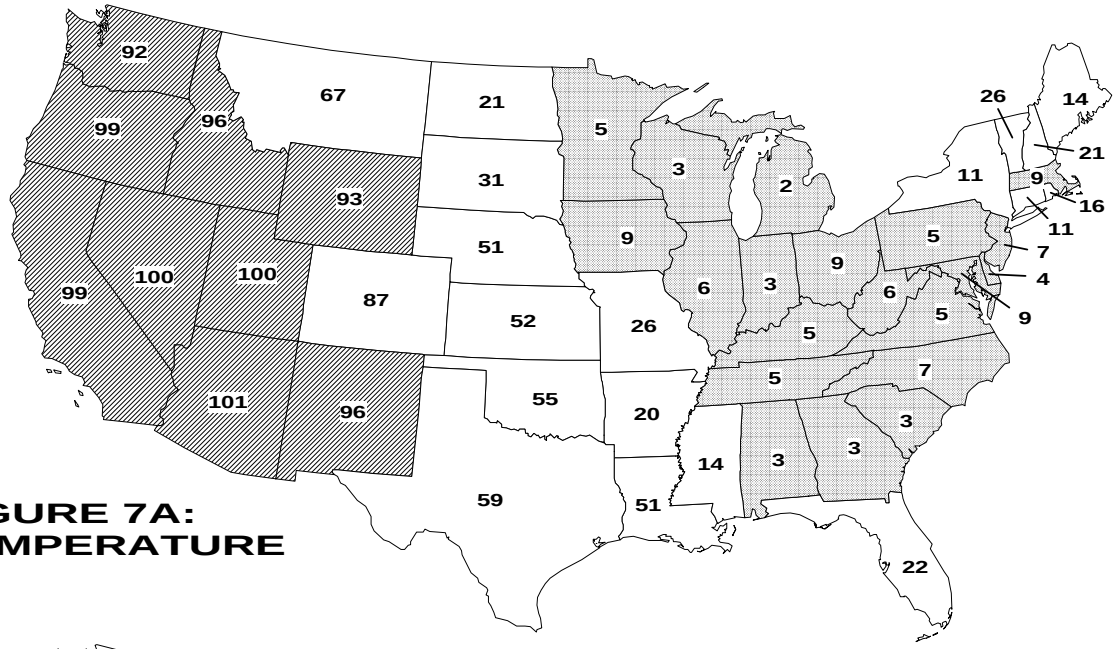

FIGURE 7A: TEMPERATURE

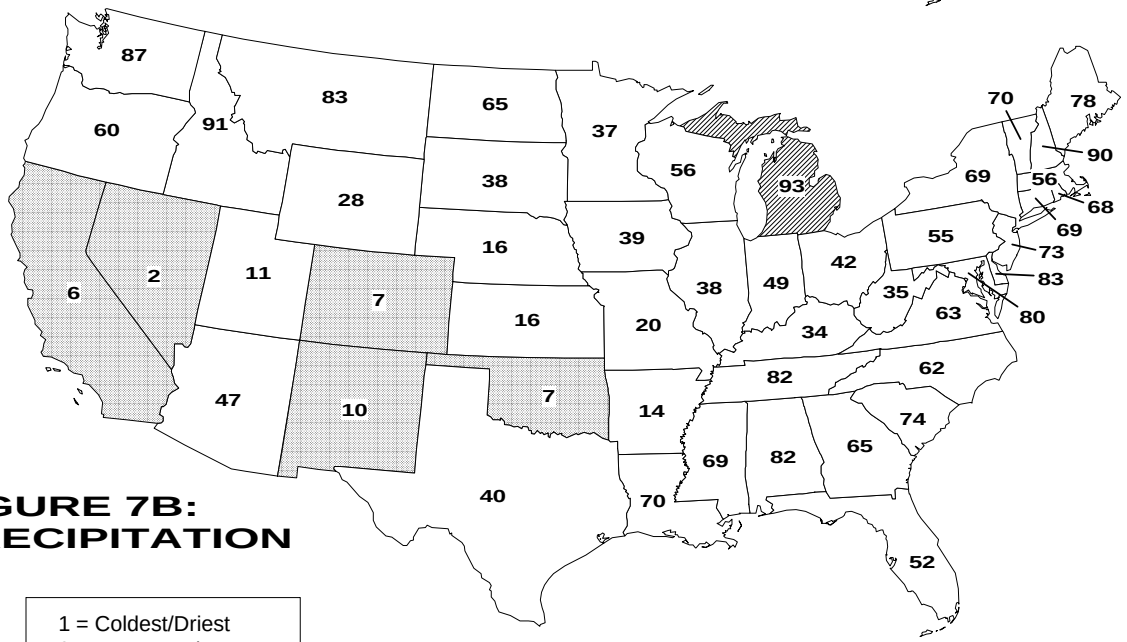

FIGURE 7B: PRECIPITATION

1 = Coldest/Driest
101 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1995. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 92-101) are shaded.

JAN-NOV 1995 STATEWIDE RANKS

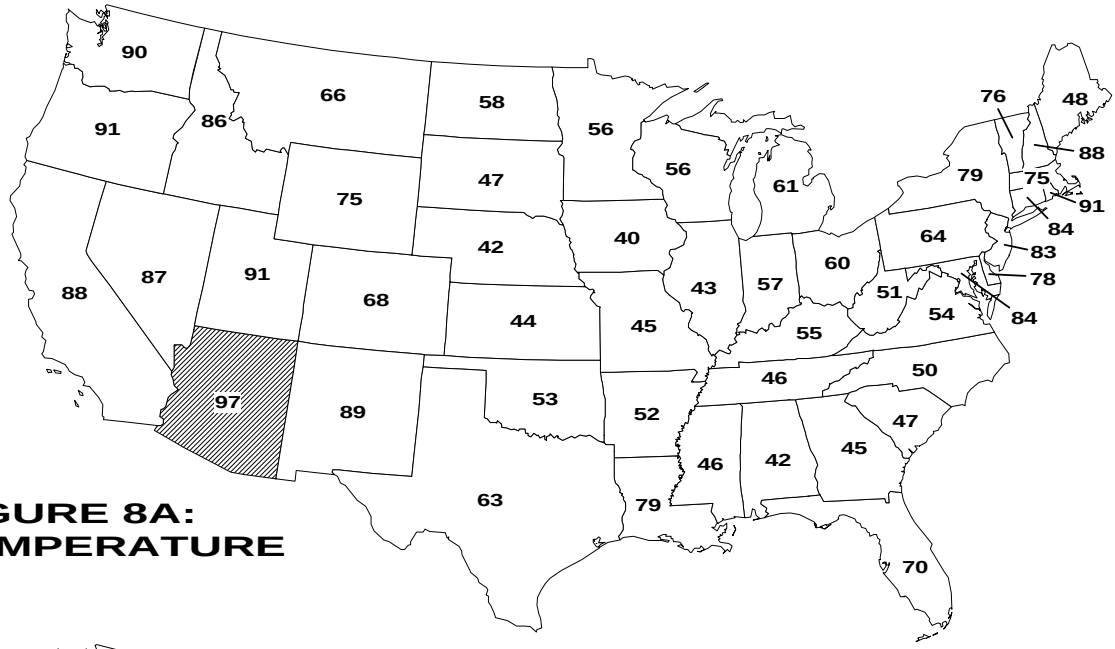

FIGURE 8A: TEMPERATURE

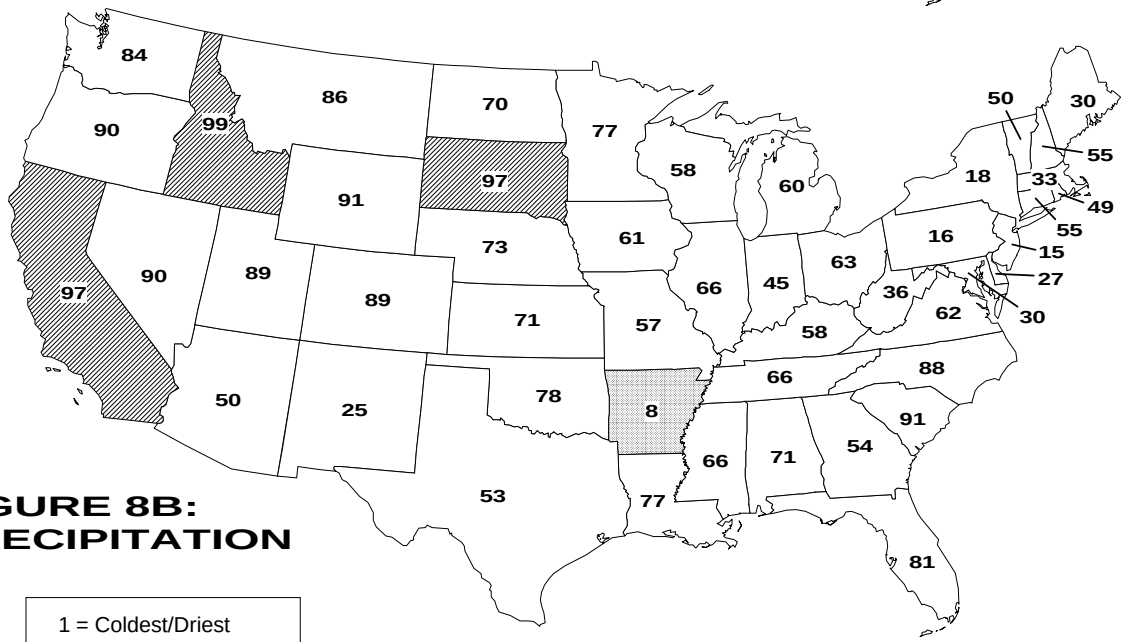

FIGURE 8B: PRECIPITATION

1 = Coldest/Driest
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National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1995. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 92-101) are shaded.

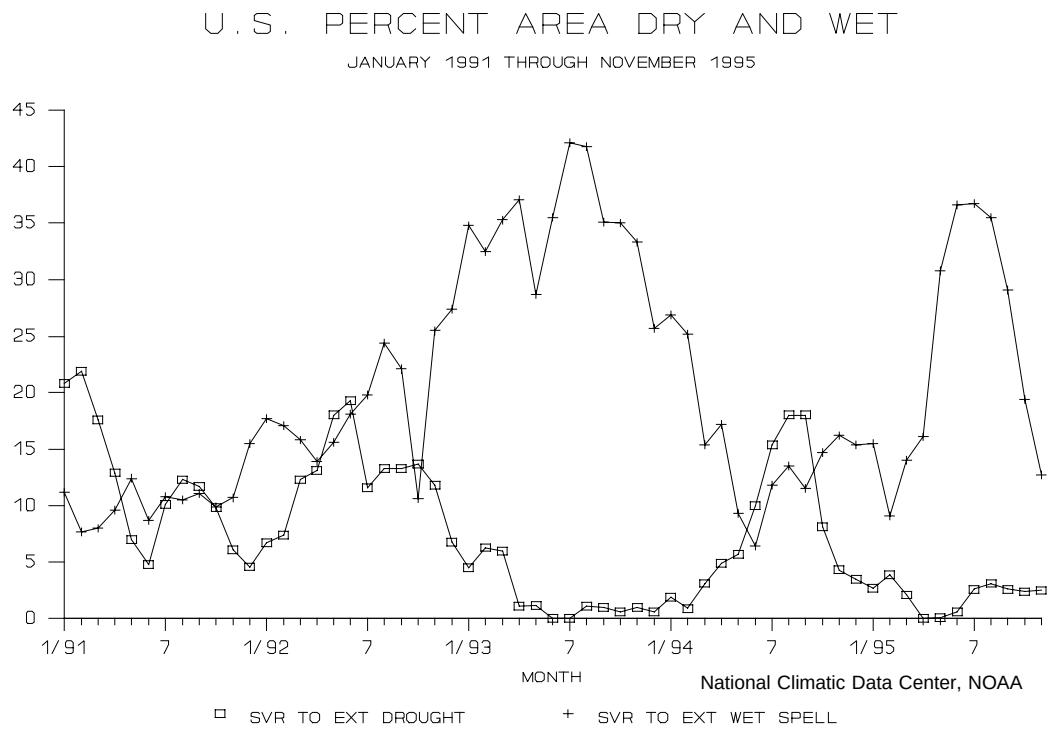


Figure 9

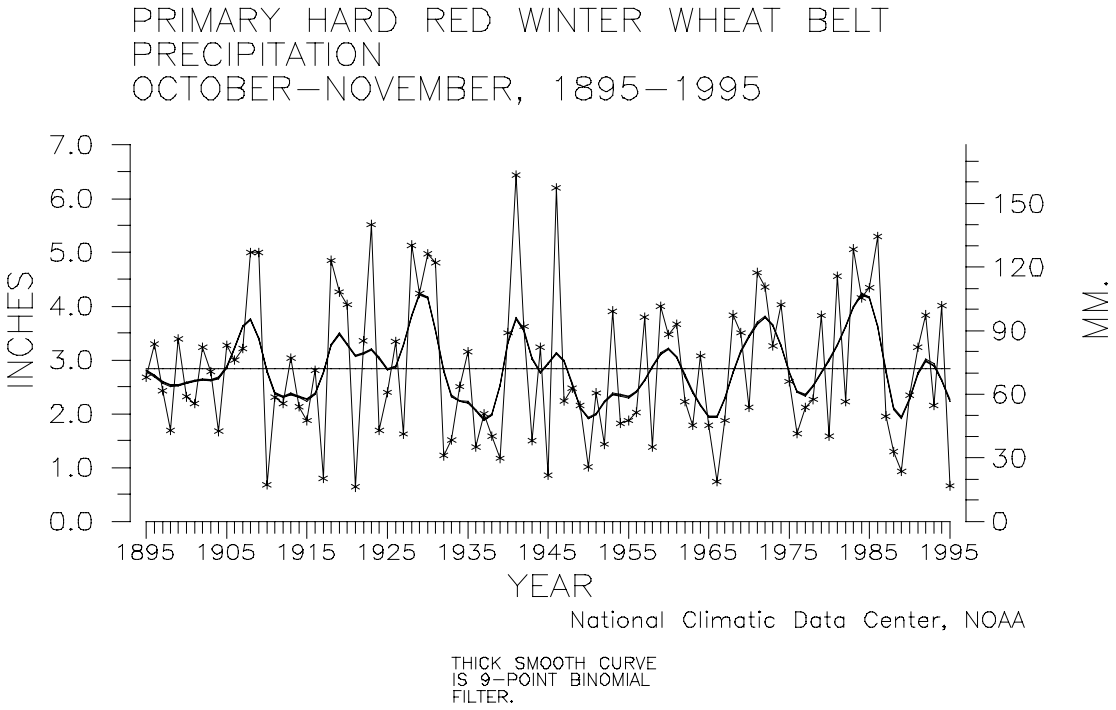


Figure 10

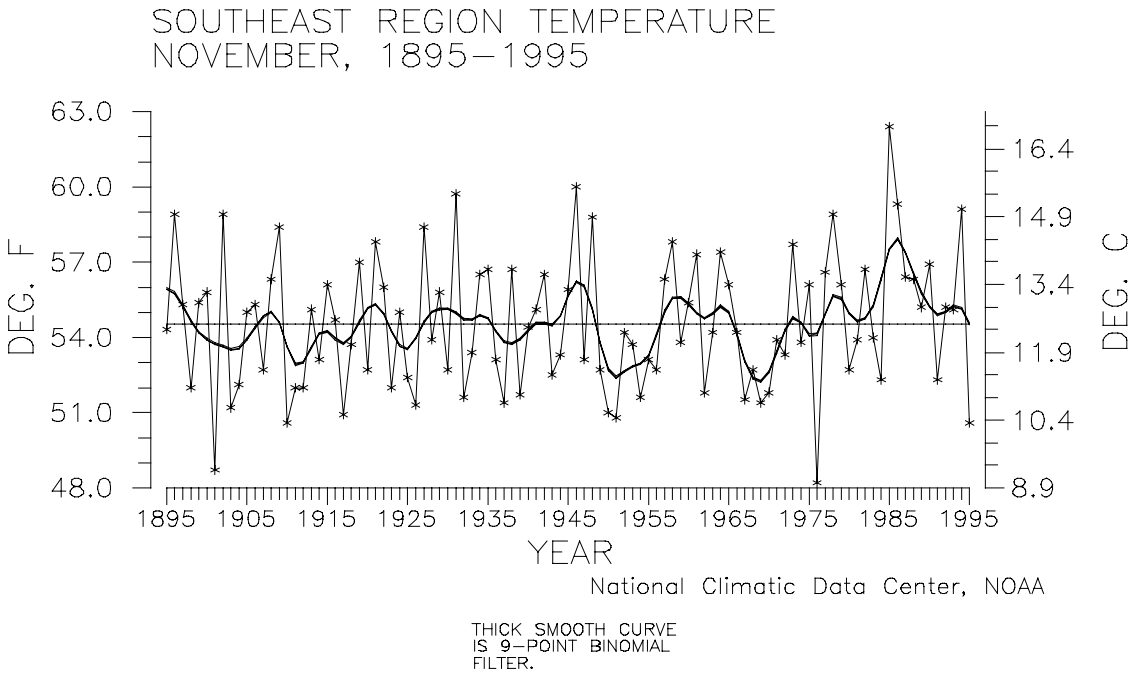
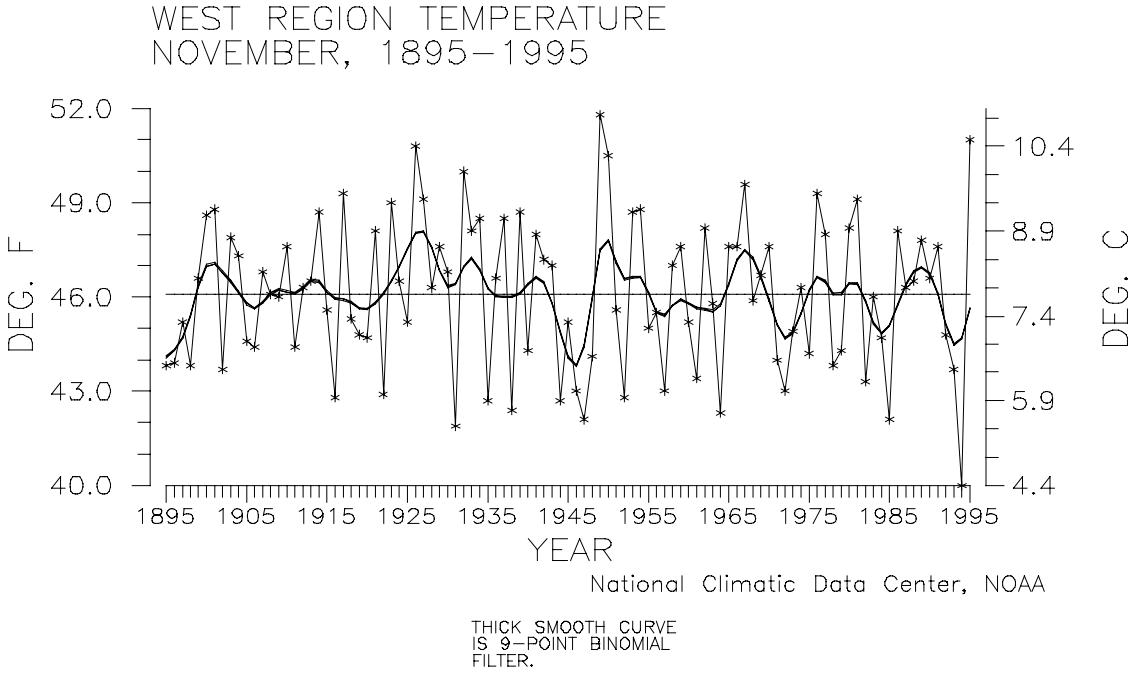


Figure 11



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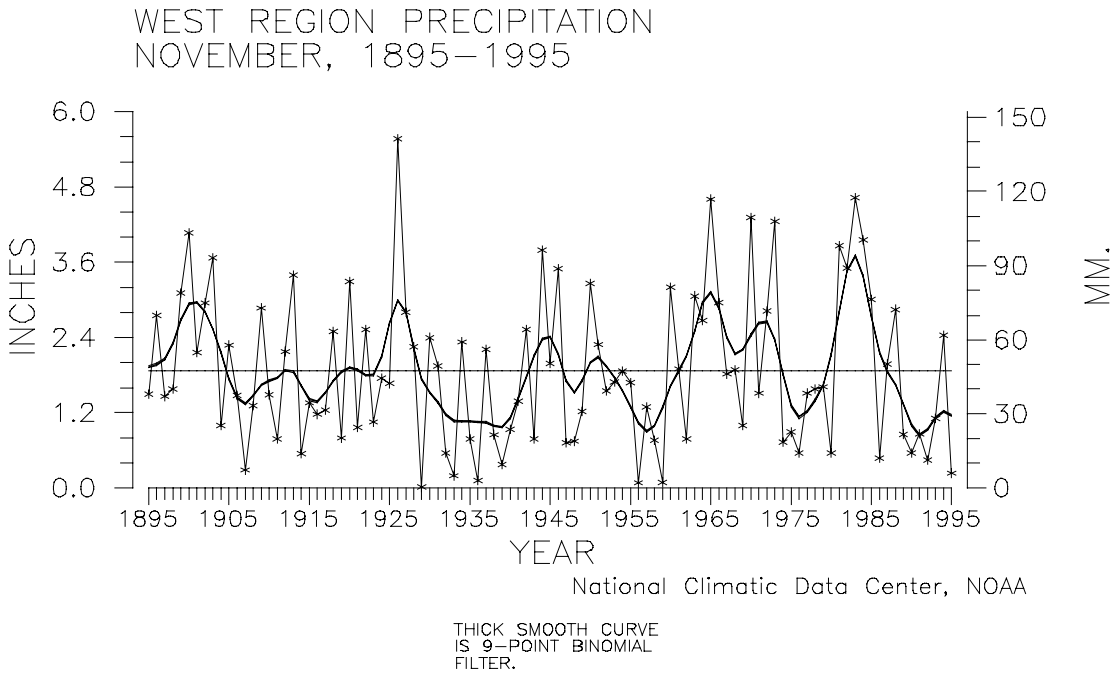

Figure 13

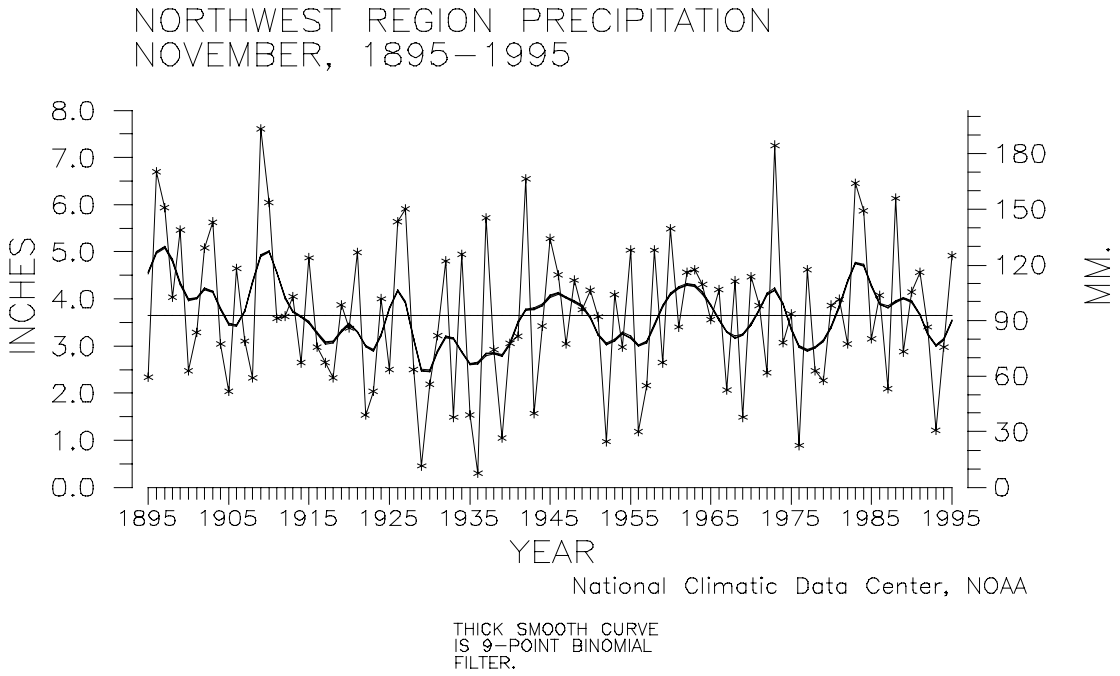

Figure 14

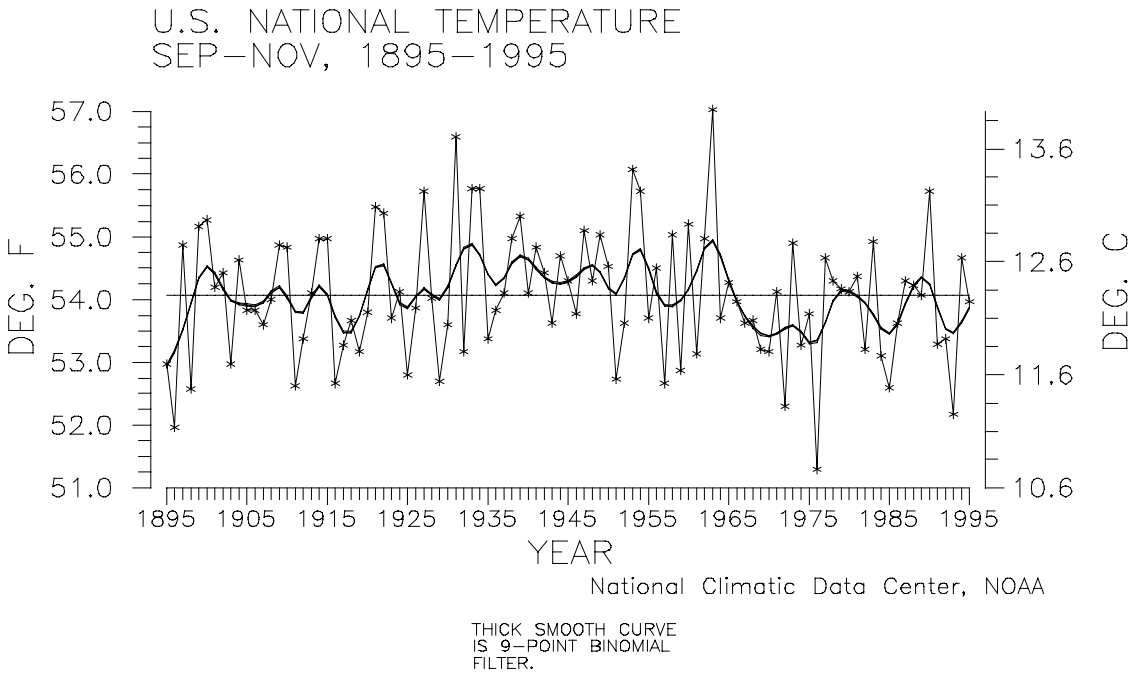

Figure 15

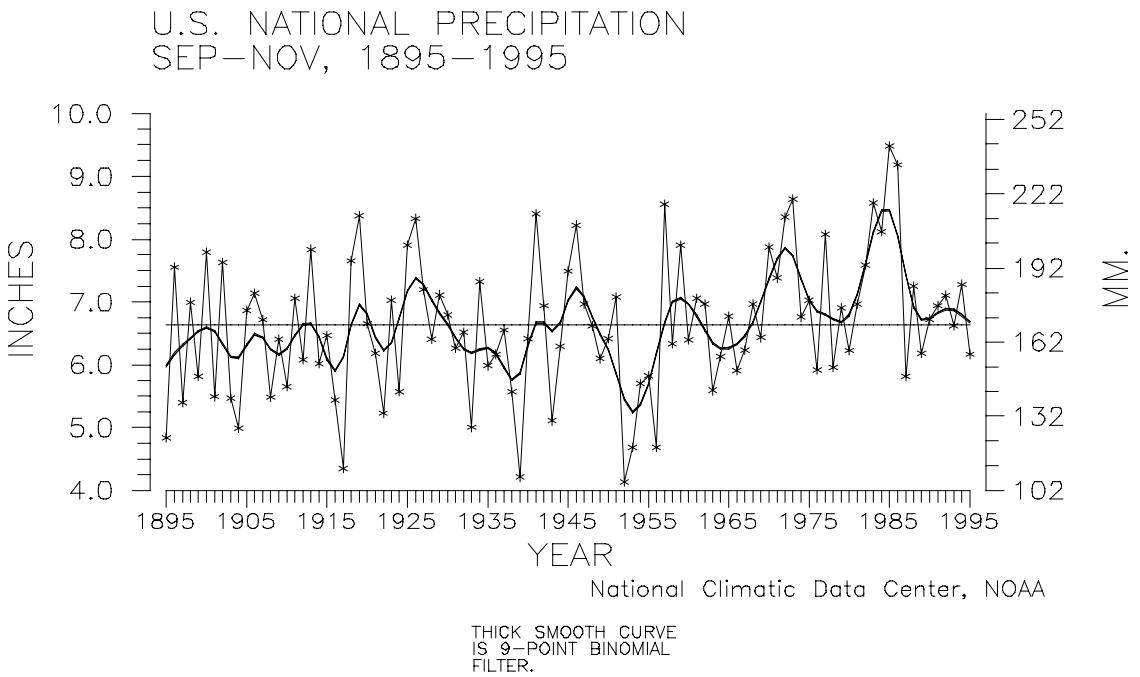

Figure 16

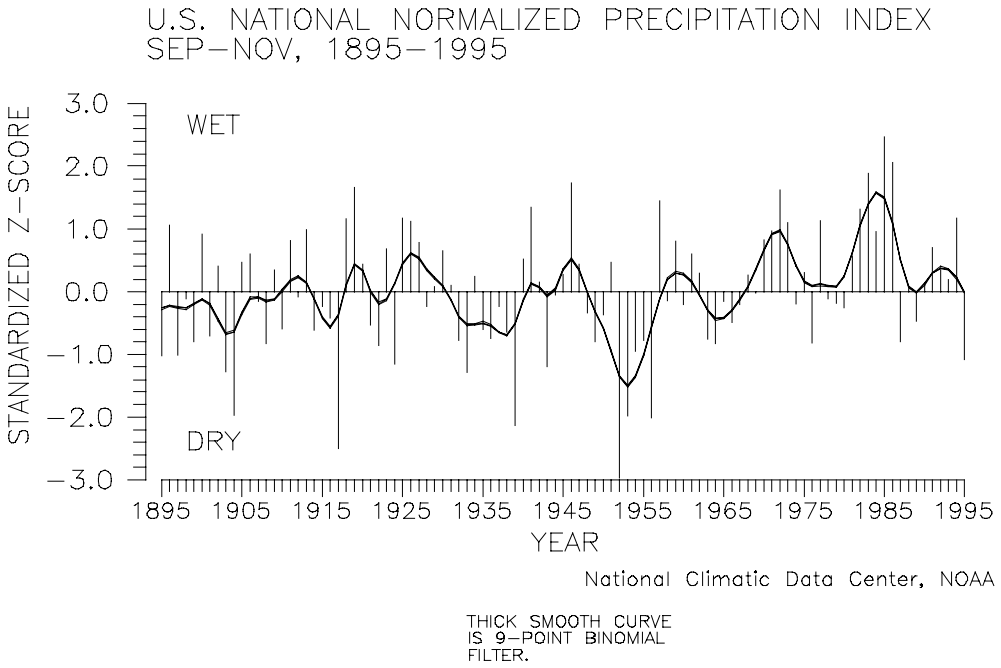

Figure 17

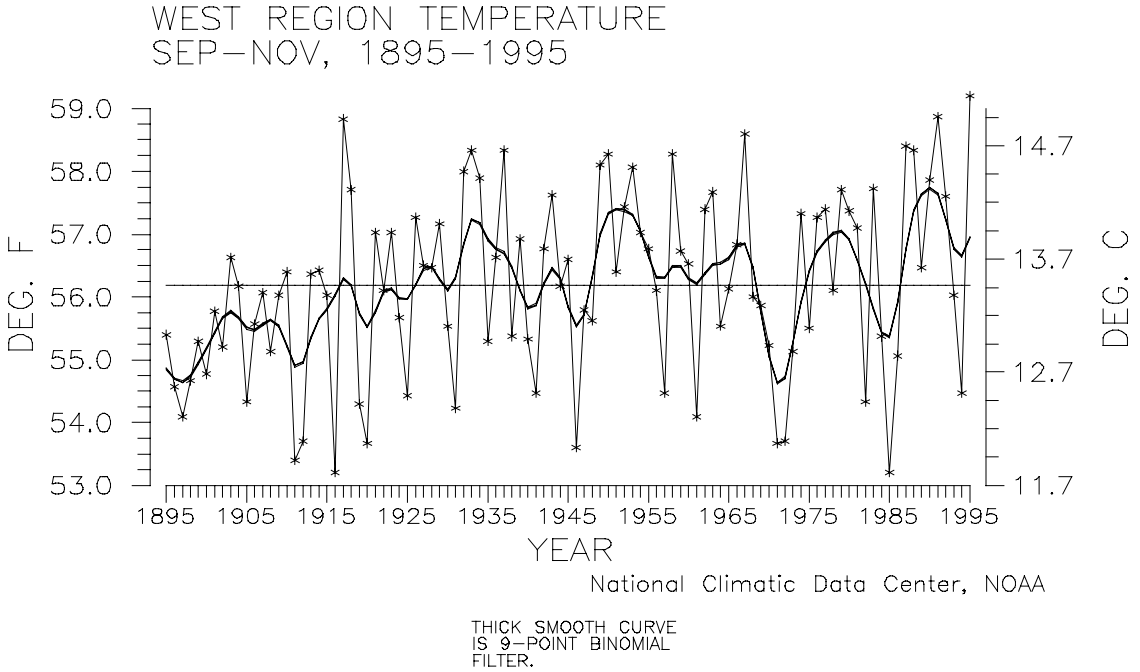

Figure 18

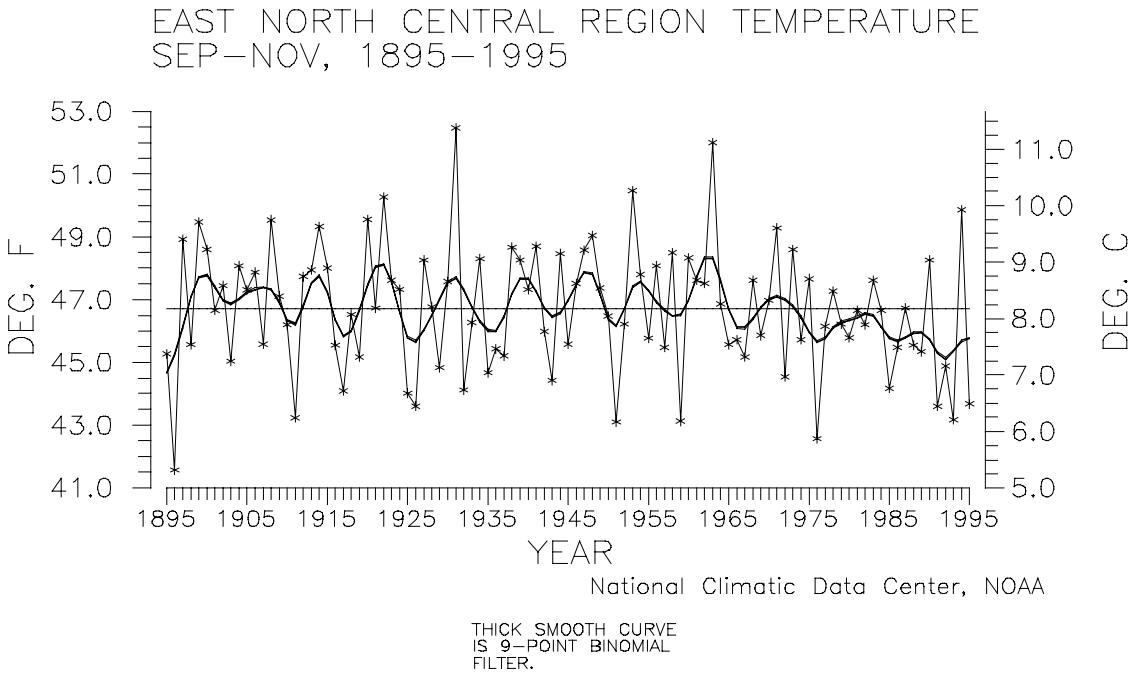

Figure 19

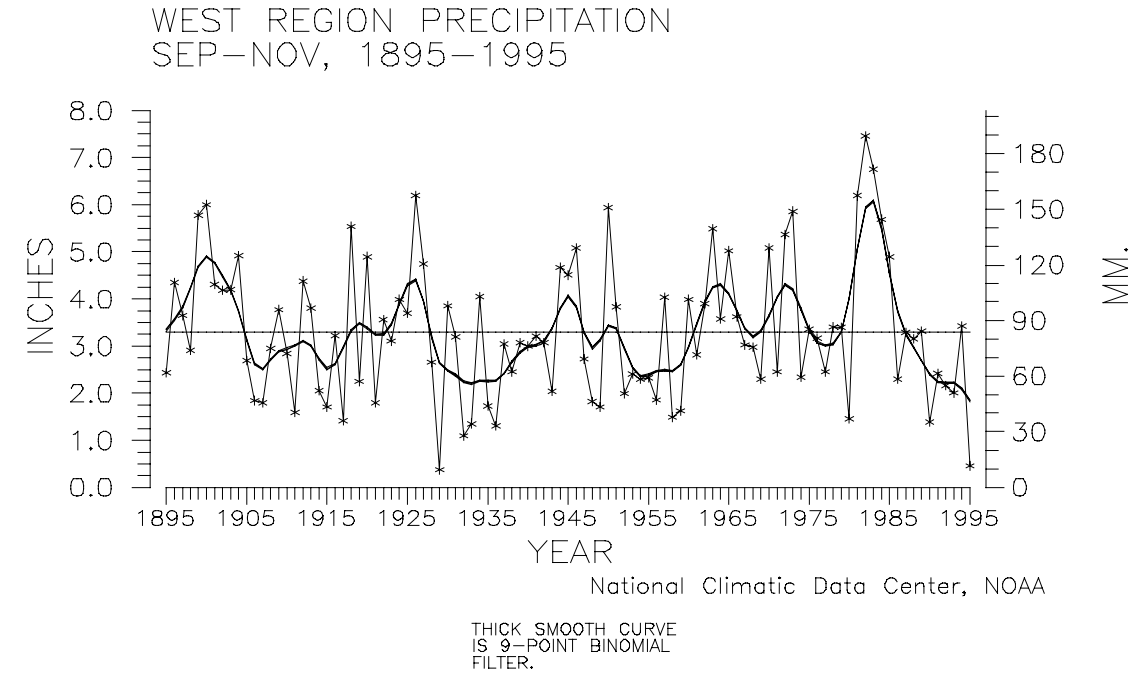

Figure 20

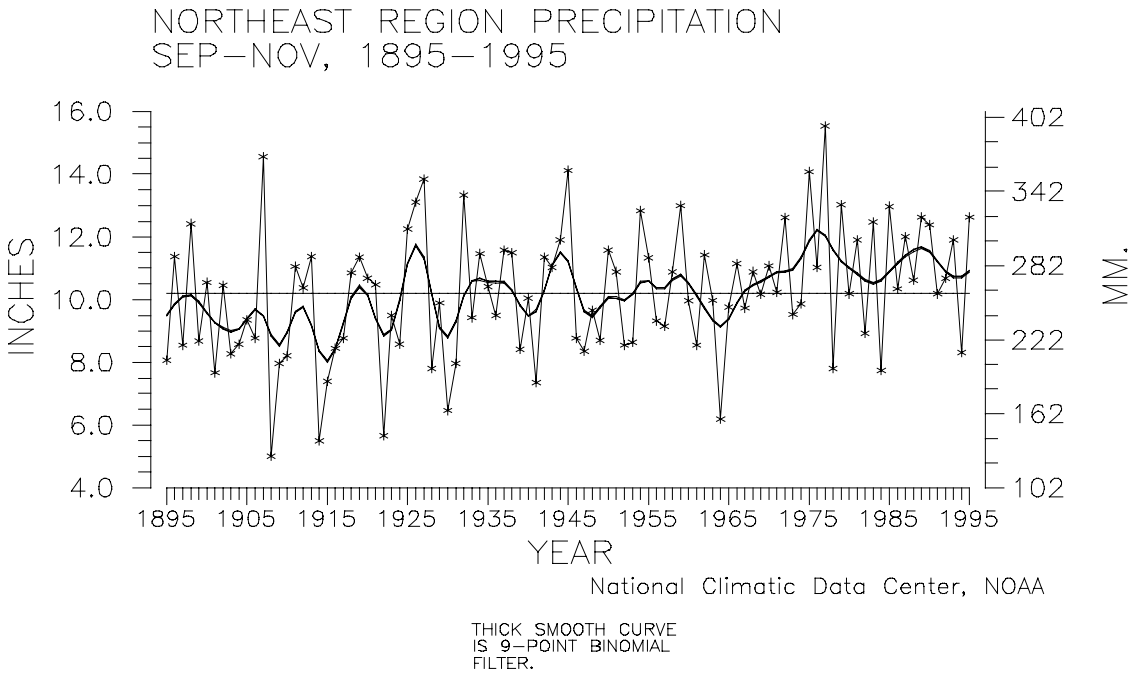

Figure 21

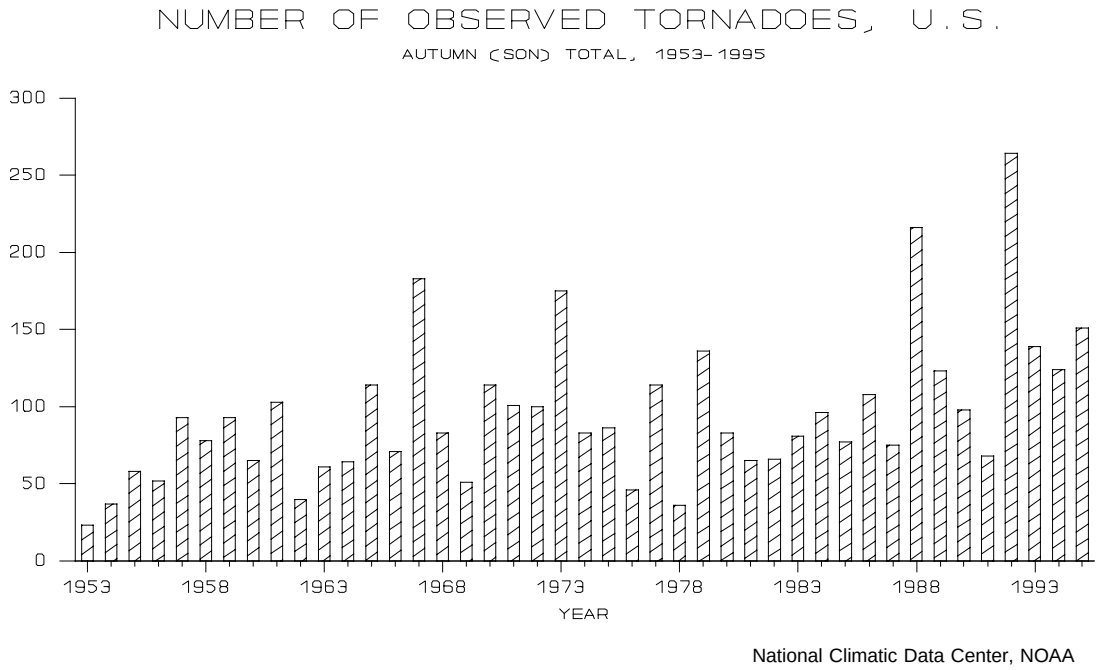

Figure 22

AUTUMN (SON) 1995 STATEWIDE RANKS

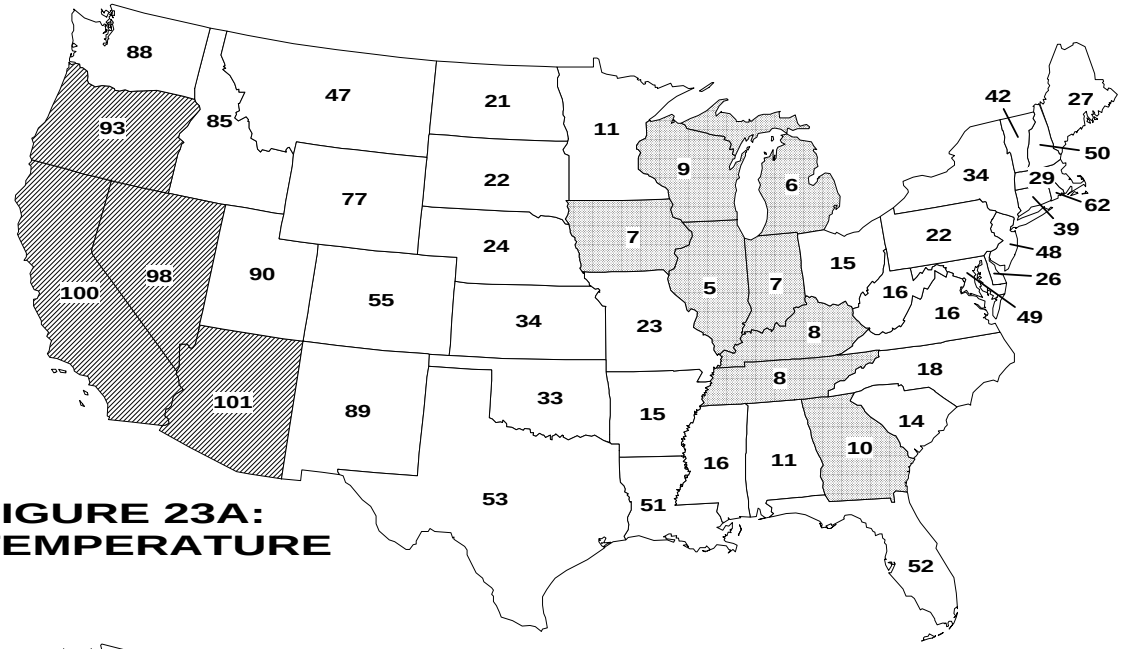

FIGURE 23A: TEMPERATURE

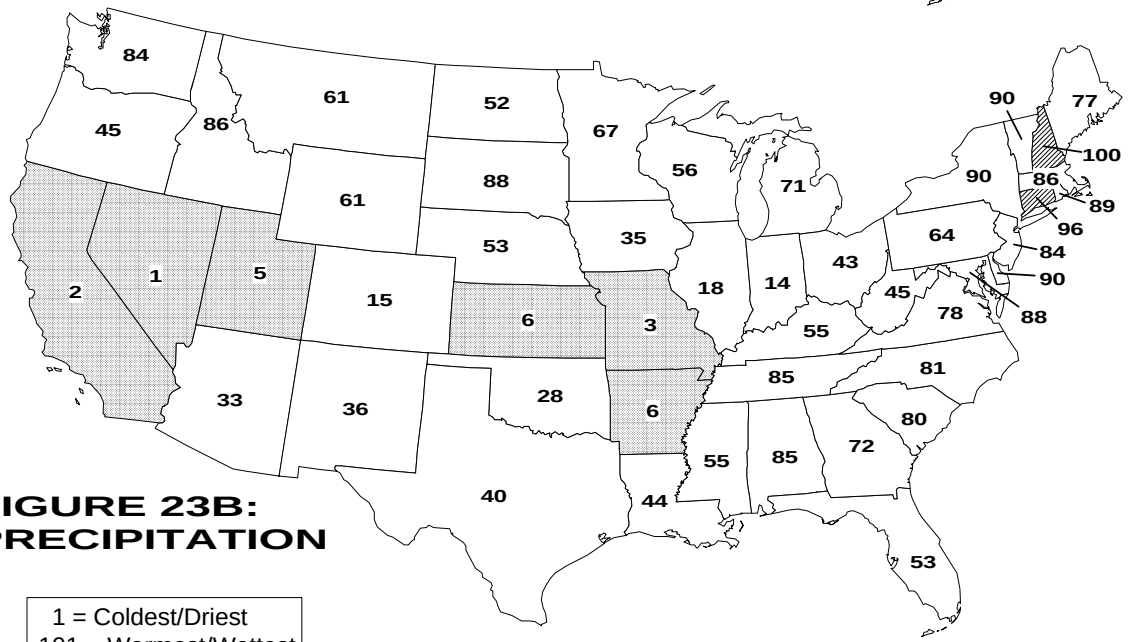

FIGURE 23B: PRECIPITATION

1 = Coldest/Driest
101 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1995. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 92-101) are shaded.